Water Quality Research Component of The Cattle Stocking Rate Experiment at MAERC

1997-1998 Progress Summary

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The water quality component of the MAERC cattle stocking rate optimization study includes an ambitious data collection program at 16 pasture plots, each instrumented with sophisticated flow and water quality monitoring systems. Construction and instrumentation of the flow and water quality measurement systems was completed in May, 1998. Data collection began at the winter pasture array in late 1997 and at the summer pastures in mid 1998.

Little flow and water quality data was collected from March to July of 1998 because of the dry conditions on the pastures. No significant runoff events have occurred during this period. During the 1998 rainy season several runoff events have occurred and runoff data have been collected..

The project is currently in the "equilibration phase" during which water quality effects of the ditch and flume construction are being allowed to diminishing prior to implementation of the stocking rate treatments in November, 1998. Water quality data collected during the early part of the project (during construction and soon after installation of the flumes) exhibited high total phosphorus concentrations, but these levels have decreased dramatically after the initial months of the project as shown in the water quality data tables below.

Summary Tables for Water Quality Results.

Full period of record:

	Mean Concentration, mg/L			
Station	**NH3**	**NOx**	**TKN**	**TP**
W1	0.12	0.01	5.1	0.34
W2	0.14	0.01	3.8	0.14
W3	0.04	0.01	4.0	0.10
W4	0.13	0.01	3.3	0.10
W5	0.47	0.00	14.4	0.71
W6	0.06	0.01	2.9	0.05
W7	0.11	0.00	3.5	0.15
W8	0.12	0.01	3.6	0.19

Post-stabilization period of record:

	Mean Concentration, mg/L			
Station	**NH3**	**NOx**	**TKN**	**TP**
W1	0.03	0.01	2.40	0.06
W2	0.07	0.01	3.40	0.10
W3	0.04	0.01	3.50	0.09
W4	0.06	0.01	2.80	0.05
W5	0.04	0.01	2.60	0.04
W6	0.06	0.00	2.70	0.05
W7	0.19	0.01	3.30	0.06
W8	0.08	0.01	2.60	0.05

The project web page includes all primary project documents (statement of work, CompQAP, QAPP, and reports. The site, located at www.imok.ufl.edu/buck, is being continually expanded to include additional site images and reports.

A new addition to this website is a page dedicated to the stocking rate project and the associated Florida DEP grant at http://www.imok.ufl.edu/buck/stocking. Included on this website is the standard operating procedure (SOP) developed for the automated water quality sampling system and for the manual grab sampling task. This SOP is posted on the project web page along with the database entry form for samples collected by the ISCO units.

1998-1999 Priorities

Experiment Implementation

The equilibration phase will continue through November, 1998 at which time the winter pastures will be stocking according to the planned treatment rates. A meeting of project participants will be held to further discuss this issue and decide on a specific schedule for implementation of the treatments and system measurements.

Field Instrumentation

The software currently used to collect the flow data and control the automatic samplers is functional, but is undergoing review and upgrades to better address our project needs. The primary upgrade sought for the system is the addition of automatic telemetry and Internet-based data retrieval, inspection and processing. Another primary goal for enhanced field instrumentation is the addition of water table monitoring wells. Ground water wells are essential for complete water budget calculations and accurate rainfall-runoff modeling.

Standard Operating Procedures

Additional SOPs will be developed to instruct field maintenance and data collection personnel on the proper servicing and data extraction procedures for the datalogger systems. The water quality sampling SOP will also be improved and revised.

Data Processing

Previously-collected runoff data will be adjusted to reflect offset adjustments recorded in the field notes. Automated systems for data processing will be developed using SAS, SQL, HTML, and JAVA software environments.